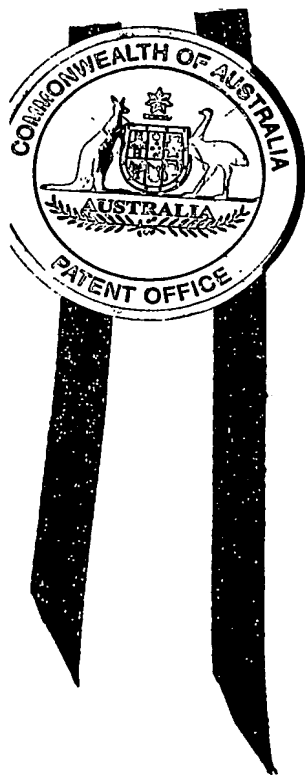




PCT/AU2004/001362

**Patent Office  
Canberra**

I, JULIE BILLINGSLEY, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2003905449 for a patent by EASTLAND MEDICAL SYSTEMS LTD. as filed on 06 October 2003.



WITNESS my hand this  
Fourteenth day of October 2004

A handwritten signature in cursive script, reading "J. Billingsley".

**JULIE BILLINGSLEY  
TEAM LEADER EXAMINATION  
SUPPORT AND SALES**

**ORIGINAL**  
**AUSTRALIA**

*Patents Act 1990*

**PROVISIONAL SPECIFICATION**

**Invention Title: "Inoculation Device"**

**The invention is described in the following statement:**

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**"Inoculation Device"****Field of the Invention**

This invention relates to an inoculation means.

**Background of the Invention**

- 5 This invention relates to a means to facilitate inoculation of patients which requires the creation of a number of punctures in the skin of a patient. An example of the application of the invention relates to inoculation against small pox by utilisation of a suitable vaccine. It is a characteristic of such inoculation that rather than inject the medium into the muscle tissue of the body it is
- 10 necessary to introduce the medium into the skin or epidermis of the patient at a number of locations.

**Disclosure of the Invention**

- Accordingly the invention resides in a inoculation device comprising a body having a fixed portion and a moveable portion, said fixed portion having a front
- 15 face, the moveable portion supported from the fixed portion to the rear of the front face, a needle supported from the movable portion to be moveable on relative movement of the movable portion with respect to the fixed portion, towards and away from the front face whereby free end of the needle is moveable between a retracted position at which the free end of the needle lies to
- 20 the rear of the front face and an extended position at which the free end of the needle extends in front of the front face, said movable portion being biased to the retracted position, an indexing means provided between the moveable portion and the fixed portion to cause the needle to move across the face on effecting a movement between the retracted position and the extended position.
- 25 According to a preferred feature of the invention the said front face is provided with an aperture which defines a path for the needle across the face and wherein

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said free end of the needle moves along the path as a result of the indexing action of the indexing means.

According to a preferred feature of the invention the indexing means causes the needle to move beyond the path defined by the aperture on completion of  
5 passage along the path.

The invention will be more fully understood in the light of the following description of one specific embodiment.

### **Brief Description of the Drawings**

The description is made with reference to the accompanying drawings of which:

10 Figure 1 is an isometric front view of inoculation device according to the embodiment;

Figure 2 is a sectional side elevation of the embodiment;

Figure 3 is a rear exploded isometric view of the embodiment;

Figure 4 is a front exploded isometric view of the embodiment;

15 Figure 5 is a sectional side elevation of the base of the embodiment;

Figure 6 is a side elevation of the moveable portion;

Figure 7 is a front elevation of the moveable portion;

Figure 8 is a sectional side elevation of the moveable portion;

Figure 9 is a rear isometric view of the rotary member;

20 Figure 10 is a front isometric view of the rotary member;

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Figure 11 is a side elevation of the closure of the embodiment;

Figure 12 is a sectional side elevation of the closure.

#### **Detailed Description of Specific Embodiment**

The embodiment relates to an inoculation device which can be utilised in  
5 inoculating patient with a vaccine where the process requires creating a number  
of punctures in the skin to enable the introduction of the vaccine into the body.

The embodiment comprises a base 11 which supports a moveable member 13  
which in turn supports a needle 15. The base 11 is formed as a cylindrical  
member having an open front face which is defined by an annular flange 17. The  
10 open front face of the base 11 supports a closure 19 which is fixedly supported  
from the base 11. The rear most end of the base 11 is formed with a waisted  
portion 23. The interior of the base 11 adjacent the waisted portion 23 is formed  
with a first tooth shaped formation 25 in which the teeth 25 are directed axially  
towards the front face of the base.

15 The closure member 19 is fixedly received in the open end of the front face of the  
base 11 and comprises a circular panel 26 which closes the open front face of  
the base 11. The face of the circular panel 26 is offset rearwardly from the open  
end of the base whereby when the base is in engagement with a surface the  
portion of the open front face as defined by circular panel is spaced away from  
20 the surface. The closure further comprises a skirt 27 which is formed at the rear  
face of the perimeter of the panel. The skirt 27 is formed around its most edge  
with a second tooth shaped formation 29 which is of corresponding form to the  
first tooth shaped formation 29. The closure member is supported within the  
25 base such that the peaks of the first tooth shaped formation 25 are slightly  
angularly offset from the peaks of the second tooth shaped formation 29. In  
addition the internal radial face of the skirt 27 of the closure member at a position  
adjacent the panel is formed with a set of ratchet like teeth 31 (see Figure 12)  
which extend for a portion of the inner circumference of the skirt. The panel 26 is

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formed with aperture 21 which is of a part annular configuration which is concentric with the centre of the panel.

The moveable portion 13 comprises a cylindrical body which is slidably received in the waisted end 23 of the base 11 to be axially slidable within the base 11.

- 5 The innermost end of the moveable member 13 is provided with a plurality of protrusions 33 which are intended to be engaged by the tooth shaped formations 25 and 29 of the base 11 and closure 19 on relative axial displacement of the moveable member 23 with respect to the base 11.

- 10 In addition the base portion 11 supports a rotary member 35 which is rotatably received within the skirt 27 of the closure 19 and against the inner face of the panel 26. The rotary member is provided with a radially directed pawl 37 having an outer edge which extends beyond the perimeter of the rotary member 35 such that it will bear upon the inner radial face of the skirt 27 which is provided with the ratchet teeth 31. The interaction of the pawl 37 with the ratchet teeth 31 permits  
15 rotation of the rotary member 35 in one direction but not in the other. In addition the rotary member 35 is provided with the circular aperture 39 which is off centre and is intended to align with the aperture 21 provided in the closure 19. The inner face of the rotary member 35 is provided with a pair of axially directed post members 41 which are spaced from each other (see Figures 9 and 10).

- 20 The moveable member 13 is provided with inwardly and axially directed spigot 43 which is provided with a bore at its inner end which is intended to receive and fixedly support the needle 15. The needle is supported such that it is radially off-centre and the degree of radial offset corresponds to that of the aperture 21. The spigot 43 is provided with an axial flange 45 which is slidably received within the  
25 post members 41 and the spacing between the post members 41 corresponds to the thickness of the axial flange 45.

A spring 47 is provided between the moveable member 13 and the inner axial face of rotary member 35 and serves to bias the moveable member 13 axially outwardly from the base 11.

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The interrelationship between the moveable member 13 and the rotary member 35 is such that whilst the moveable member 13 is moveable axially relative to the rotary member 35 the two components are fixed rotationally whereby rotation of the moveable member 13 results in rotation of the rotary member 35 and the direction of rotation of the movable member 13 and the rotary member 35 is controlled by the interaction of the pawl 37 of the rotary member with the ratchet teeth 31 of the closure.

In addition the interaction of the protrusions 33 on the movable member with the tooth formations 25 and 29 are such that on the moveable member 13 being moved inwardly the protrusion 33 will move from the first tooth shaped formation 25 into the second tooth face formation 29 and will be displaced angularly as a result of that interengagement. On the subsequent return of the moveable member 13 to its outer position with respect to the base 11 under the influence of the spring 47 the movement of the protrusion 33 from the second tooth shaped formation 29 to the first tooth shaped formation 25 will cause angular displacement of the moveable member with respect to the base 11. The interengagement of the pawl 37 with the ratchet teeth 31 will ensure that the angular movement of the moveable member 13 with respect to the base 11 is in the same direction.

The off centre positioning of the needle 15 causes the needle to move in a path around the centre of the closure as the movable member is indexed as a result of the interaction of the movable member with the toothed formations. At least a portion of that path corresponds with the aperture 21. When the moveable member 13 is at its outermost at rest position with respect to the base 11 the free end of the needle 15 is located within the base 11 and rearward of the front face. On movement of the moveable member 13 into the base 11 and when the needle is aligned with the aperture the free end of the needle 15 will be caused to move through the aperture 21 such that its free end lies in front of the front face of the base 11.

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In use it is intended that initially, the needle 15 will be located within the base to be aligned with one end of the aperture 21 and with repeated depressions of the moveable member 13 with respect to the base 11 the needle will be carried along the length of the aperture 21. On the needle reaching the other end of the aperture 21 it will move to a position lying inward of the panel and out of alignment with the panel of the closure member 19. When at this position the movable member will be prevented from sufficient axial movement within the base and therefore to be able to be indexed any further that on successive depressions of the moveable member 13 with respect to the base 11 as a result of the outer end of the needle engaging with the rear face of the panel 26 at which point in time the inoculation device will have reached the end of its usefulness and can be safely disposed of.

In addition the outer cylindrical wall of the base in the region of the front face is formed with a cut away portion 47 and the corresponding portion of the skirt of the closure 19 is formed with a rib 49 of complementary configuration to the cutaway portion. The rib 49 co-operates with the cutaway portion of the base to prevent relative rotational movement therebetween. In addition the cut away portion provides a visual and tactile indicator to an operator using the device of the manner in which the device is to be used.

The free end of the needle 15 is provided with a number of pricks 49 such that with each excursion from the retracted to the extended position as shown at Figure 2 the device will form a plurality of punctures in the skin of the patient.

The effect of the inoculation device is that it is capable of repeatedly producing a number of punctures in a particular zone on the skin of a patient in order to effect adequate inoculation of a vaccine. Once the inoculation process has been completed the needle is safely accommodated within the device and the device cannot be used again and therefore can be safely discarded.

Throughout the specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood



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to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

It should be appreciated that the scope of the invention need not be limited to the particular scope of the invention described above.

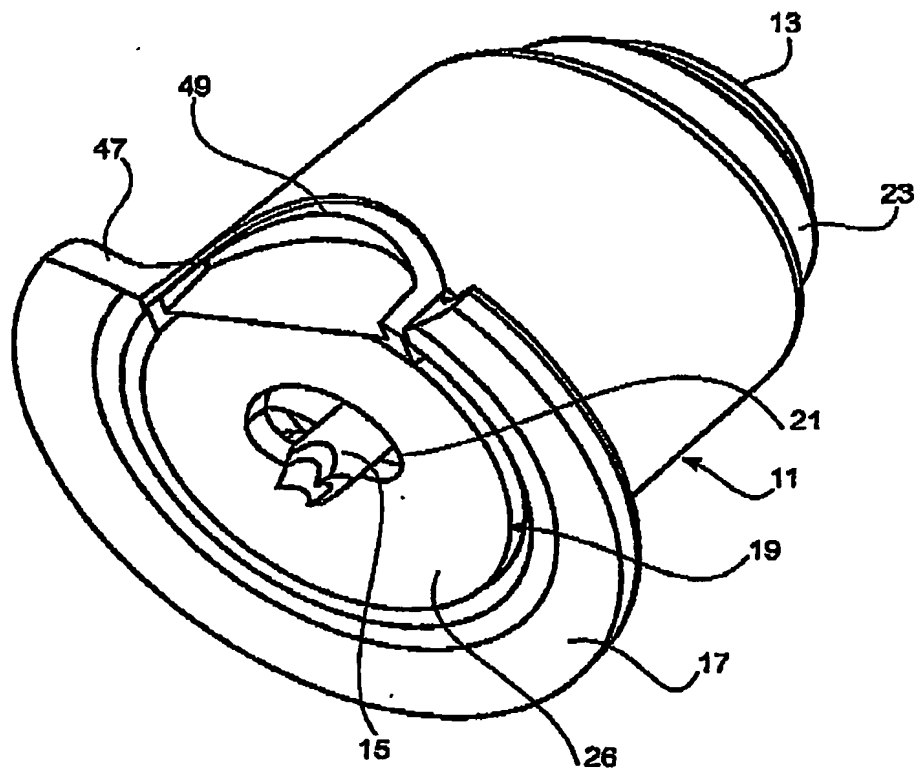
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Dated this sixth day of October 2003.

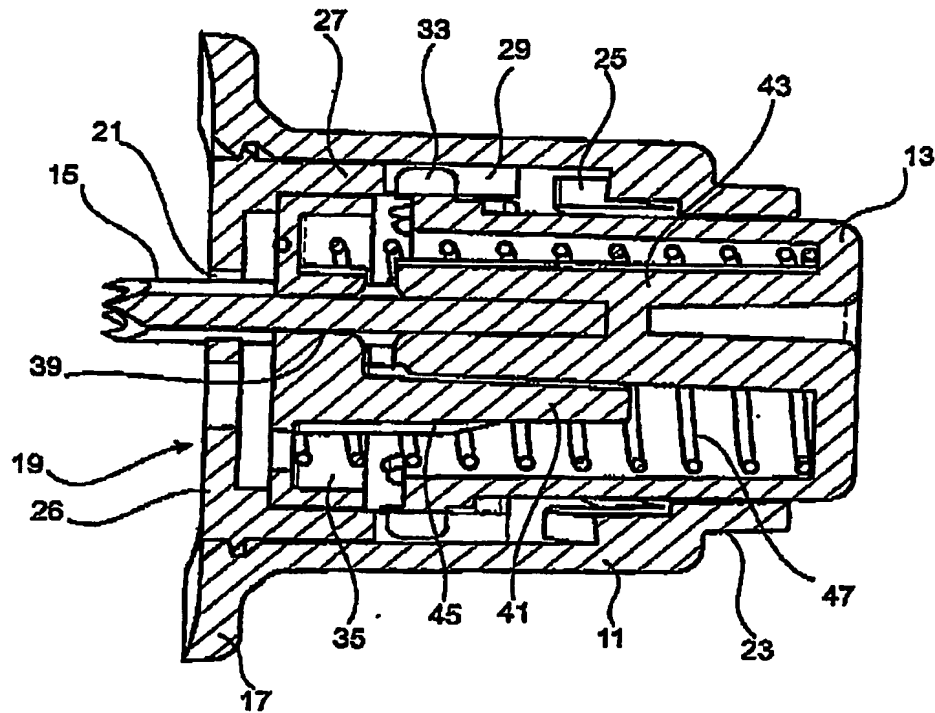
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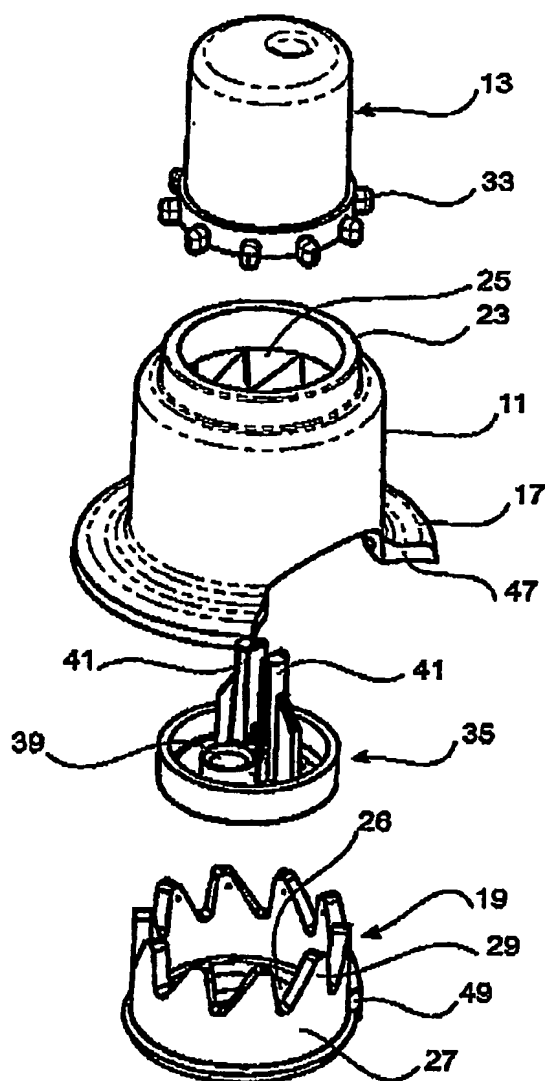
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**Fig. 1.**

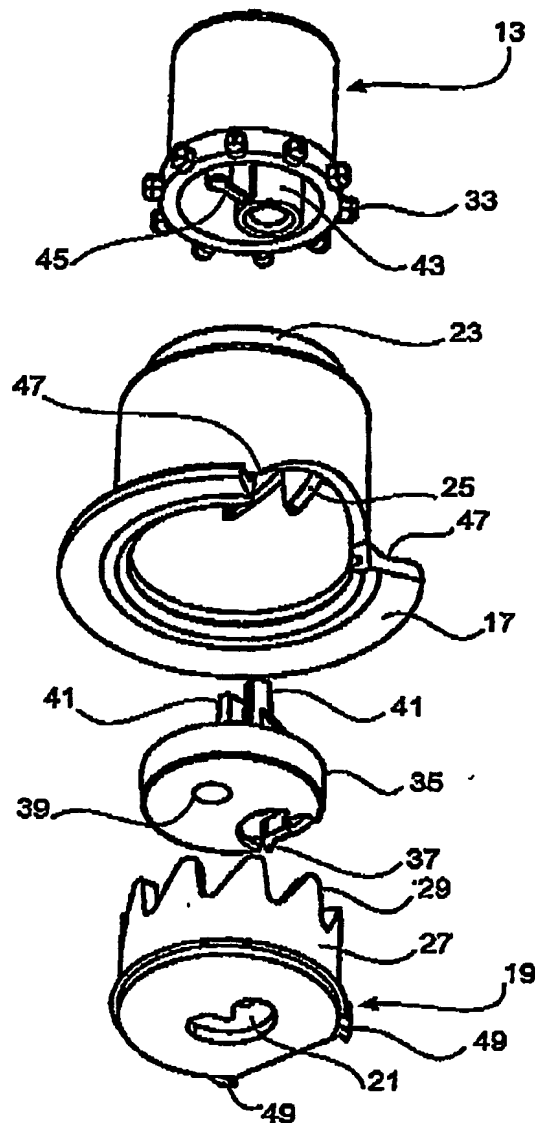
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**Fig. 2.**

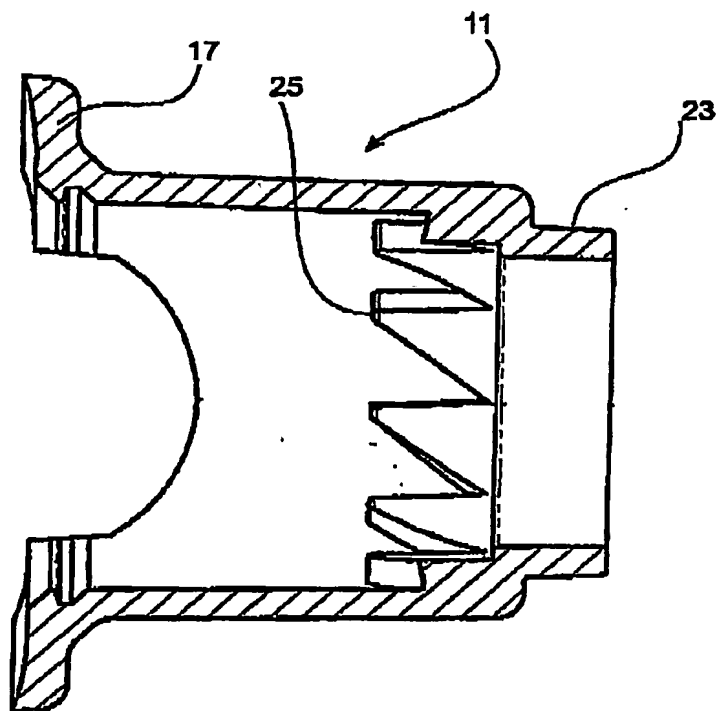
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**Fig. 3.**

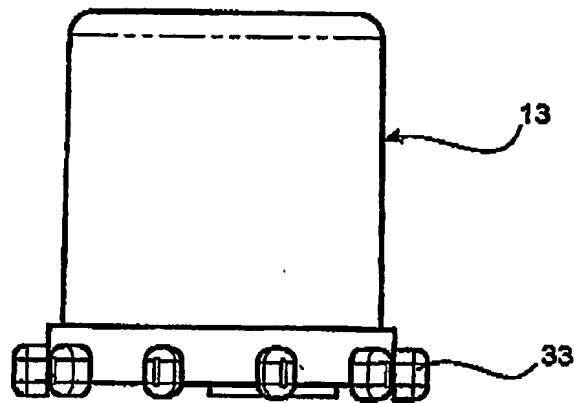
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**Fig. 4.**

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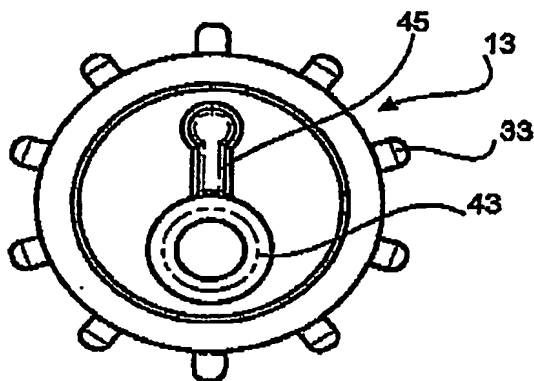
**Fig. 5**

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**Fig. 6.**

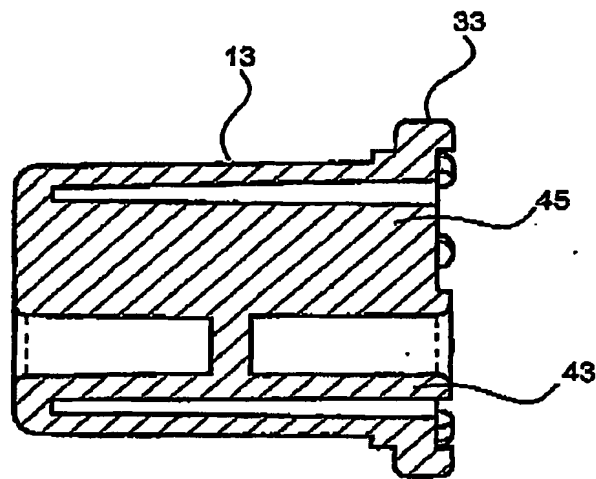
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**Fig. 7,**

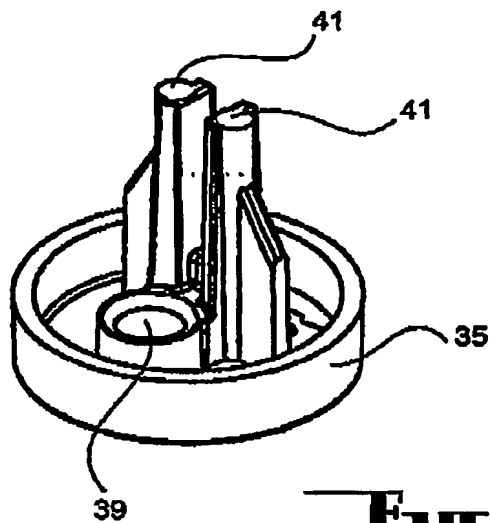
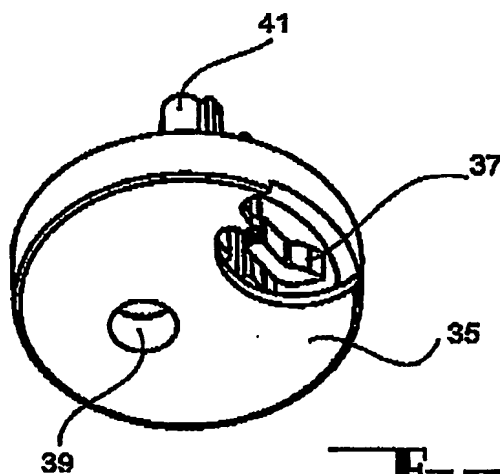


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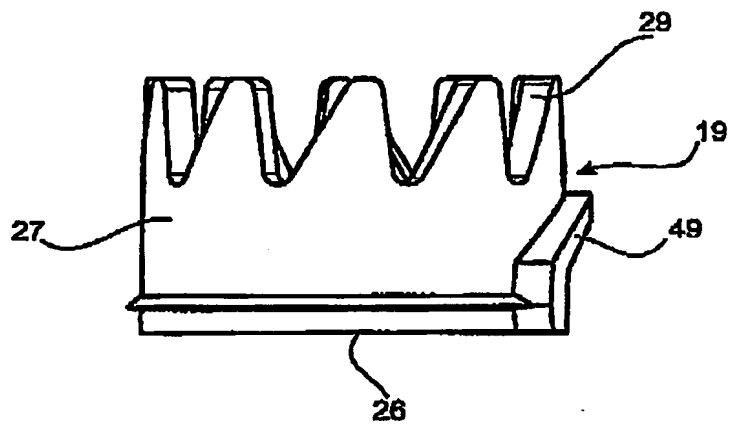


**Fig. 8.**

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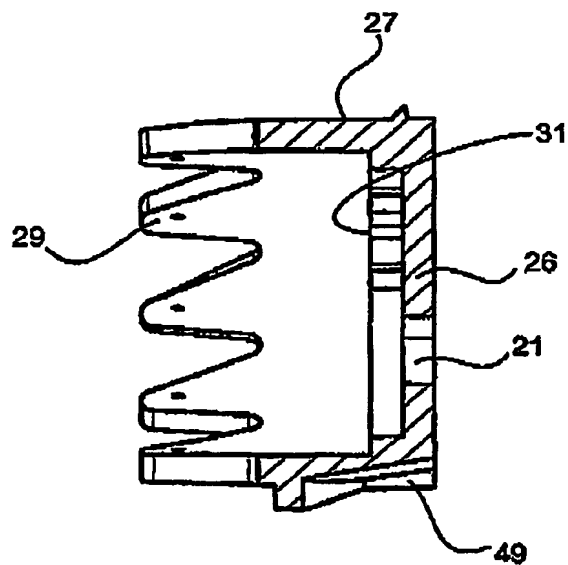
**Fig. 9,****Fig. 10,**

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**Fig. 11,**

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**Fig. 12.**

# Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/AU04/001362

International filing date: 06 October 2004 (06.10.2004)

Document type: Certified copy of priority document

Document details: Country/Office: AU  
Number: 2003905449  
Filing date: 06 October 2003 (06.10.2003)

Date of receipt at the International Bureau: 01 November 2004 (01.11.2004)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



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